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The anti-hunting movement--the people involved, their attitude development, and implications for wildlife management

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The anti-hunting movement--the people involved, their attitude
development, and implications for wildlife management

by

Alice Wywialowski

A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
MASTER OF SCIENCE

Department: Animal Ecology
Major: Wildlife Biology

Signatures have been redacted for privacy

Iowa State University
Ames, Iowa

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TABLE OF CONTENTS

	Page
INTRODUCTION	1
REVIEW OF LITERATURE	2
METHODS	4
Sample Design	4
Operationalization of Variables	5
Statistical Tests	5
Response Rate	5
RESULTS AND DISCUSSION	7
Formation of Anti-hunting Attitudes	7
Background variables	9
Sex	9
Childhood residence	9
Age	10
Education	11
Occupation	12
Income	12
Hunting-related values and beliefs	14
Background variables and beliefs and values about hunting	14
Relationships between the three major sets of variables	17
Issues Related to Wildlife Management	18
Funding	20
Management priorities	21
Improvements in sport hunting	23
SUMMARY	26
RECOMMENDATIONS AND CONCLUSIONS	27
LITERATURE CITED	29
ACKNOWLEDGEMENTS	37

INTRODUCTION

Hunting in the United States has been assumed to be a right of the people (Cain 1962). Recently, more people have begun to challenge that assumption (Trainer 1976) as well as the desirability of hunting as a sport. Public sentiment against hunting has increased in the past few years (Applegate 1975). The main objectives of this study are to explain the formation of anti-hunting attitudes and their implications for wildlife management.

To meet the first objective, data from other surveys was used to predict the characteristics of those with anti-hunting attitudes. While many have studied hunters (see Schole 1973a for a review), few have studied those against hunting (Shaw 1974, 1975, 1976, 1977; Shaw and Gilbert 1974). In accordance with past studies (Klessig 1970, Applegate 1975), it was predicted that the highest percentage of anti-hunting attitudes would be in groups with background characteristics such as female, young to middle-aged, from an urban childhood residence, white-collar occupation, higher level of education and low income. Values such as anti-kill and anti-cruelty were predicted to be closely associated with an anti-hunting attitude because values and beliefs related to hunting were thought to be more closely associated with attitude toward hunting. The specific values and beliefs acquired are probably influenced by the background characteristics of the individual. Shaw (1975) described a similar model for the formation of anti-hunting attitudes.

Issues directly related to wildlife management may be affected by individuals involved in the anti-hunting movement. Some wildlife professionals have recently begun to promote nonconsumptive wildlife programs as well as the need for another source of funds for such programs (Crouse 1974, Talbot 1974, Crawford 1976). With these issues in mind, as well as the need to view hunting as a privilege, some questions were designed to learn how anti- and pro-hunting individuals felt about these issues.

REVIEW OF LITERATURE

The controversy surrounding hunting is not new (Leopold, 1933, Errington 1947, Anthony 1957, Krutch 1957, Clarke 1958, Cain 1962), but its presence has become more visible during the past few years (Gilbert 1967, Caras 1970, Godlovitch et al. 1972, Ortega y Gasset 1972, Zern 1972, Klein 1973, Shaw 1973, TWS-New York Chapter 1973, Amory 1974, Hope 1974, LeResche 1974, Brister 1975, Durslag 1975, Kozicky and Madson 1975, Madson 1975, Towell 1975, University of Wisconsin-Stevens Point 1975, Trainer 1976). More importantly, public sentiment against hunting has increased in the past few years (Applegate 1975).

With public pressures on wildlife agencies increasing, those agencies have increased their efforts to respond to or at least become aware of public attitudes toward their policies. In the past, attempts to deal with the human aspect of wildlife management have been descriptive surveys of the economic aspects of hunting (Kyle 1956, Shelton 1969, Nobe and Gilbert 1970, Sendak and Bond 1970, Pearse Bowden Economic Consultants Limited 1972, Gum et al. 1973, Martin et al. 1974, Norman et al. 1975?), the characteristics of hunters (Peterle 1961, 1967; Durell 1962, 1967; Yuhas 1962; Folkman, 1963; Udall et al. 1965; Kirkpatrick 1966; Zimmerman 1966; Lobdell 1967; Bevins et al. 1968; Finegan 1970; Garrett 1970; Greene 1970; Klessig and Hale 1972; Sofranko and Nolan 1972; Watson et al. 1972; Potter et al. 1973a; Schole 1973a, 1973b), and hunter attitudes (Searcy 1954; Lacaillade 1968; Moss et al. 1969; Klessig 1970; More 1970, 1973; Sofranko and Nolan 1970; Hendee and Potter 1971; Hendee 1972, 1974; Eisele 1973; Klessig and Hunt 1973; Potter et al. 1973b; Schole et al. 1973; Stankey et al. 1973; Thomas et al. 1973, 1976; Kennedy 1974a, 1974b; Volk and Montgomery 1974; Bjornn and Dalke 1975; Langenau and Jamsen 1975; Smith and Roberts 1976; Ratti and Workman 1976). The emphasis on hunters and their attitudes was probably due to the perception held by many wildlife managers that wildlife management is the promotion of a surplus of game animals to be harvested by hunters.

Today, more managers perceive the need to recognize the general public's desires as well as those of hunters, though few studies have dealt with attitudes of the general public (Wievel 1947; Erickson 1970; Applegate 1973; Brown 1974; Hansen et al. 1974; Kitts and Low 1974; Linder et al. 1974; Rosonke 1974; Shaw 1974, 1975, 1977; Shaw and Gilbert 1974; Wagner and Dimit 1975). Only recently have individuals in the wildlife profession begun to promote nonconsumptive wildlife programs (Davey 1967; Hendee 1969; Thomas and DeGraaf 1973; Clement 1974a, 1974b; Crouse 1974; Talbot 1974; Gray 1975; Crawford 1976) and a shift in policies to meet the public's needs (Hatter et al. 1972; Murray 1972; Allen 1973; Fowler and Bury 1973; Kennedy 1973; Prenzlowl et al. 1974; Shafer and Moeller 1974; Scheffer 1974, 1976; Schick et al. 1976; Wisconsin Department of Natural Resources 1976).

METHODS

Sample Design

The population of the study was defined as all persons residing in Iowa who were 18 or more years of age as of June 1976. The sample population included all adults living in households that were listed in Iowa's telephone directories. The sampling frame should represent Iowa because of all occupied housing units in Iowa with telephone service available, 93.5 percent had telephones (1970 federal census data published in 1972 City and County Data Book by U.S. Department of Commerce).

The sample was selected to approximate a random sample of Iowans over age 18. First a sample of telephone directories was drawn, then a random sample of pages in the directory, followed by a random sample of telephone numbers on each page. The sample of telephone numbers drawn from each directory was proportionate to the fraction of the total population represented in that directory. During the telephone call, a list was compiled of all adult members of the household who were residents of Iowa. One member of the household was randomly selected to be the respondent. If the individual selected agreed to participate in the study, that person received the questionnaire.

A pretest of 100 mailed questionnaires was conducted several months prior to the full mailing. A few questions were modified for increased clarity. In the pretest as well as the full mailing, suggestions made by Dillman (1972) and Linsky (1975) were followed when feasible in an effort to increase response rate. Suggestions that were followed included: pre-contact (telephone call), a cover letter assuring anonymity of the respondent and stressing the social utility of the survey, follow-up (single mailing sent 3 weeks after the first), stamps on envelopes (first class and hand-stamped outgoing and return envelopes), letterhead stationary, and the title of the researcher with a hand signature in blue ink.

The mail package (cover letter, questionnaire, and return envelope) was sent within 3 days after that household had been contacted by telephone. If the questionnaire had not been returned within 3 weeks after the first mailing, a second questionnaire and follow-up letter

encouraging their response were sent. No effort was made to contact nonrespondents after the second follow-up.

Operationalization of Variables

Overall attitude toward hunting was determined by each individual's responses to three separate questions: position on the issue of hunting (for = 1, no opinion = 4, against = 7), overall attitude toward hunting on a 7-point scale (1 = approve to 7 = disapprove) and desire to "eliminate hunting" (check = 7, no check = 1). The sum of the three scale scores determined the attitude category into which each individual was placed (pro-hunting = 3-8, neutral = 9, anti-hunting = 10-21).

Beliefs and values that were assumed to underly attitudes toward hunting were determined by a list which incorporated some of the most common reasons college students gave for being against hunting (Shaw and Gilbert 1974), and other beliefs expressed by hunters and wildlife biologists. Appropriate items were grouped when they seemed to indicate one basic concept.

Statistical Tests

Chi-square was the basic test used to determine whether differences existed between variables assumed to be related to hunting, and attitude toward hunting. Cramer's V gives an indication of the degree of association between variables (0 = no association to approaching 1 = strong association). Kendall's Tau indicates both degree and direction of the relationship (approaching -1 = strongly inversely related, 0 = no relationship, approaching 1 = strongly directly related, Conover 1971). Kendall's Tau b and c were used for square and rectangular tables respectively.

Response Rate

Of 1,964 telephone calls made, 1,516 of the individuals contacted agreed to cooperate in the survey. The remainder of the calls were disconnections (188), refusals (146), no answer (40), and other (74). Of the 1,516 questionnaires sent, 406 were never returned, 1,060 were usable responses, 12 were returned blank, 8 were never delivered, and

30 of the people who returned the questionnaire offered a reason for not responding including: don't feel qualified (15), poor health (6), not interested (5), too old (3), and no schooling (1). The usable responses were 70 percent of the total number of questionnaires that were actually sent. Data from the 1,060 questionnaires was used for this analysis.

RESULTS AND DISCUSSION

Formation of Anti-hunting Attitudes

Understanding the formation of attitudes toward hunting would facilitate an understanding of some factors involved in the hunting controversy. A person's life experiences are influenced by the social environment in which that individual grows up. Experiences affect attitudes. Personal attributes such as sex, childhood residence, age, educational attainment, occupation and income (background variables) that influence an individual's social environment will influence that individual's attitudes (Triandis 1971). Therefore, groups with different background variables will tend to hold differing attitudes.

A certain social environment, resulting from a combination of background variables, will be conducive to the formation of certain values and beliefs. These values and beliefs will have a more direct influence on the formation of attitudes toward hunting than background variables. Therefore, values and beliefs should be better predictors of attitudes toward hunting than background variables.

The development of anti-hunting attitudes has not been discussed in any detail except by Shaw (1975). With his sample of three groups which were to represent a range of attitudes toward hunting (Michigan hunters, Audubon Society members, and supporters of Funds for Animals, Inc.), he used a four-step model to relate selected background variables to general attitude variables to wildlife-related variables to attitude toward hunting. A more simplified, but similar, three-step model (Figure 1) was used for this study, which was initiated before Shaw's work was available. The random sample of Iowa's general public provided a wide range of attitudes toward hunting. However, in the analyses, individuals were classified as having a pro-hunting ($n = 658$), neutral ($n = 164$), or anti-hunting ($n = 227$) attitude.

According to the model (Figure 1), background variables will influence the values and beliefs about hunting that influence an individual's attitude toward hunting. Participation in hunting, and background variables of the participants, have been studied many times,

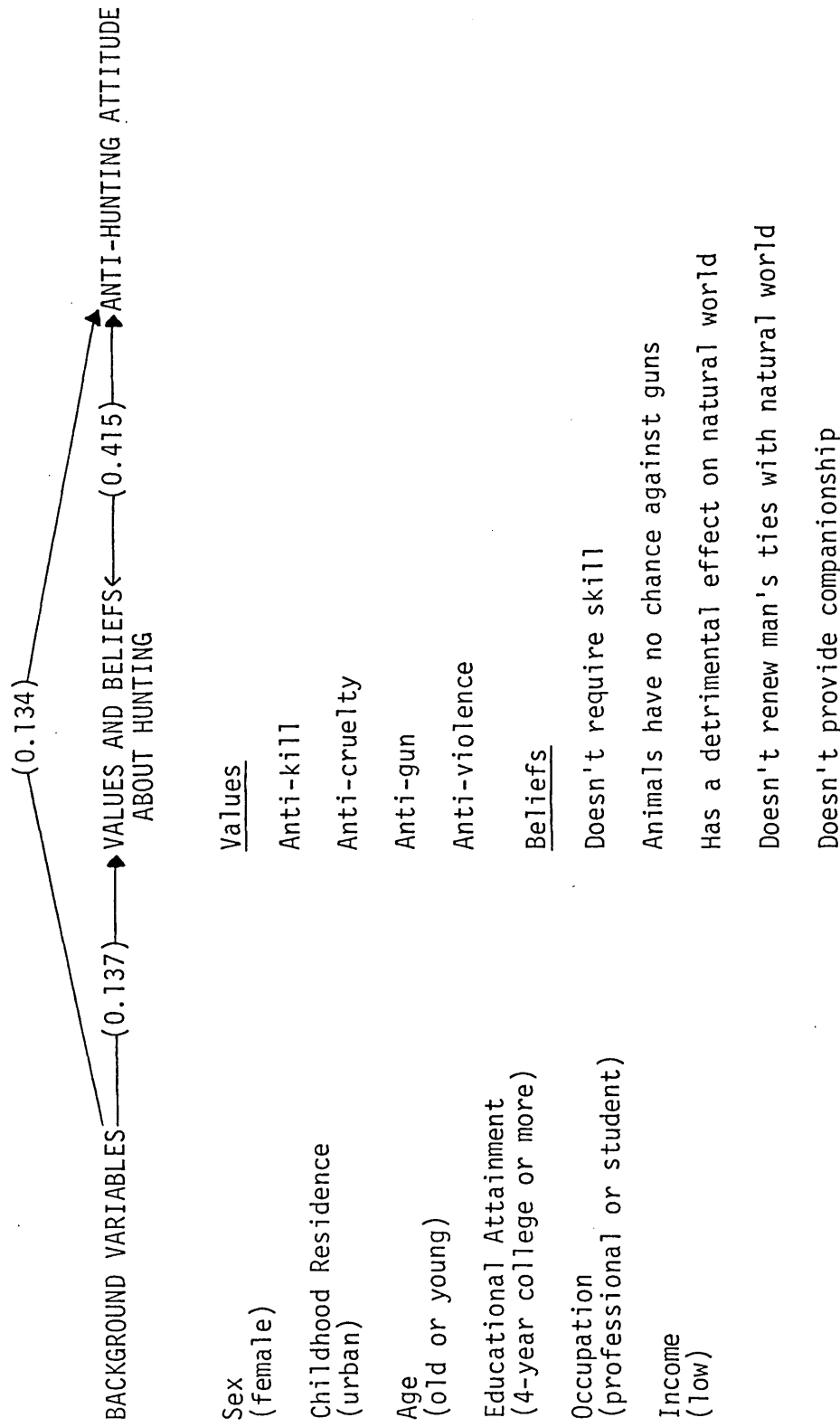


Figure 1. Model for the formation of anti-hunting attitudes. The numbers shown in parentheses are averages of the Cramer's V values for the relationships between the variables listed.

and these relationships were used to predict the relationships between background variables and anti-hunting attitudes.

Background variables

Sex Hunting has been a predominantly male sport since its inception. Participation in hunting by females may increase as societal standards of appropriate behavior for the sexes change. However, in Iowa in 1976, as hypothesized, a higher percentage of females had anti-hunting attitudes than males (Table 1). A higher percentage of females were also neutral toward the sport.

Table 1. Relationship between sex and attitude toward hunting expressed as the percentage of each attitude category per sex.
Chi-square = 35.9, 2 df, $P < 0.001$; Cramer's V = 0.186; and
Tau C = 0.176, $P < 0.001$.

Sex	Pro-hunting $\underline{n} = 652$	Neutral $\underline{n} = 161$	Anti-hunting $\underline{n} = 227$	Total $\underline{N} = 1040$
Female	53.7	19.6	26.7	50.1
Male	71.7	11.4	16.9	49.9

Childhood residence Association with individuals who hunt will influence an individual's attitude toward hunting. More hunters come from a rural childhood residence. Klessig (1970) believed that higher participation in hunting by rural residents was promoted by increased opportunity. Childhood recreation experiences in turn influence adult leisure behavior (Sofranko and Nolan 1972, Yoesting and Burkhead 1973). Anti-hunting sentiment should be greater where there are fewer hunters. As hypothesized, proportionately more individuals with an urban residence during youth had anti-hunting attitudes than those with a rural residence (Table 2). No strong relationship was expected between present residence and attitude toward hunting and none was found to exist when that relationship was tested.

Table 2. Relationship between childhood residence and attitude toward hunting expressed as the percentage of each attitude category per residence class. Chi-square = 18.9, 8 df, $P < 0.05$; Cramer's $V = 0.095$; and Tau $c = 0.024$, $P = 0.168$.

Childhood Residence	Pro-hunting $\underline{n} = 652$	Neutral $\underline{n} = 162$	Anti-hunting $\underline{n} = 226$	Total $\underline{N} = 1040$
Farm	61.8	18.2	20.0	44.3
Rural, nonfarm	66.7	7.7	25.6	3.8
Small town ($< 5,000$)	67.0	16.7	16.3	19.5
Medium town ($5,000 - 50,000$)	64.6	10.4	25.0	20.4
Large city ($> 50,000$)	54.4	15.2	30.4	12.0

Age The percentage of the total population that participate in hunting has been declining over the past several years (Marsh 1976), and anti-hunting sentiments have been increasing (Applegate 1975). It was hypothesized that a higher percentage of young and middle-aged individuals will hold anti-hunting attitudes than older individuals. According to the data, however, the age group with the highest percentage of anti-hunting individuals was the over-60 age category (Table 3). This was not due to the disproportionate number of females in the older age classes, because the same relationship existed for both females and males even while controlling for sex.

In this study, the over-60 age group also had the highest percentage of individuals neutral toward hunting. The 18-30 age category had the next highest percentage of individuals against hunting, and few who were neutral toward hunting. The group 31-60 years old had the highest percentage of pro-hunting individuals. The high percentage of younger individuals with anti-hunting attitudes corresponds with what was predicted. However, no satisfactory explanation for the high percentage of anti-hunting attitudes among those over 60 years of age is evident.

Table 3. Relationship between age and attitude toward hunting expressed as the percentage of each attitude category per age class. Chi-square = 47.0, 8 df, $P < 0.001$; Cramer's V = 0.150; and Tau c = 0.096, $P < 0.001$.

Age (Years)	Pro-hunting $\underline{n} = 651$	Neutral $\underline{n} = 162$	Anti-hunting $\underline{n} = 226$	Total $\underline{N} = 1039$
<31	68.5	9.0	22.5	25.7
31 - 40	66.1	13.5	20.4	17.9
41 - 50	68.7	12.6	18.7	14.4
51 - 60	68.6	12.4	19.0	14.7
>60	48.4	26.5	25.1	27.3

Education According to Klessig (1970), more individuals with a higher level of education are likely to quit hunting, followed by those with less education. Those with a high school education (medium level) were least likely to have deserted. Because more hunters with a higher level of education are likely to quit hunting, that group of people with a higher educational attainment will associate with fewer hunters and be more likely to develop anti-hunting attitudes. As hypothesized, a higher percentage of individuals with a higher educational attainment had anti-hunting attitudes than those with less formal education (Table 4). The highest proportion of anti-hunting sentiment was in the group with a 4-year college degree and the smallest proportion was in the group with a 2-year college degree. The proportion of the group neutral toward hunting was inversely related to educational attainment. The proportion of pro-hunting individuals was highest for those with a 2-year college degree followed by those with a post-graduate degree and then those with a high school diploma. Individuals with pro-hunting attitudes were proportionally fewer among those with no degree and the proportion was intermediate for those with 4-year college degrees or professional certificates. The group of people with professional certificates encompassed diverse types of degrees. As a group

Table 4. Relationship between educational attainment and attitude toward hunting expressed as the percentage of each attitude category per level of education. Chi-square = 38.2, 12 df, $P < 0.001$; Cramer's $V = 0.136$; and Tau $c = -0.015$, $P = 0.274$.

Educational Attainment	Pro-hunting $n = 650$	Neutral $n = 162$	Anti-hunting $n = 227$	Total $N = 1039$
None of the above	48.6	31.4	20.0	3.4
Grade school	53.5	24.5	22.0	15.3
High school	66.2	14.8	19.0	51.2
Two-year college	68.3	14.6	17.1	7.9
Professional certificate	60.8	12.6	26.6	7.6
Four-year college	58.6	7.8	33.6	11.1
Post-graduate degree	66.7	5.5	27.8	3.5

the proportion in each attitude category was intermediate between those groups with 2-year and 4-year college degrees.

Occupation As hypothesized, a higher percentage of white-collar workers had anti-hunting attitudes than blue-collar workers (Chi-square = 7.4, 2 df, $P = 0.02$). Anti-hunting attitudes occurred most frequently in professional and student occupation classes and were lowest in blue-collar and farmer classes (Table 5). Individuals with anti-hunting attitudes were not present as frequently as was expected in white-collar skilled and semi-skilled classes. For both blue- and white-collar groups, the semi-skilled group had a relatively higher percentage of people with anti-hunting attitudes than the skilled group.

Income Because of the higher rate of desertion from hunting among the lower-income groups (Klessig 1970), it was predicted that anti-hunting sentiments would be more prevalent among lower-income people. As hypothesized, a higher percentage of individuals with lower incomes had anti-hunting attitudes than upper- and middle-income individuals (Table 6). The highest proportion of anti-hunting

Table 5. Relationship between occupation and attitude toward hunting expressed as the percentage of each occupation class in each attitude category. Chi-square = 49.6, 16 df, $P < 0.001$; Cramer's $V = 0.159$; and Tau $c = -0.063$, $P = 0.010$.

Occupation	Pro-hunting $\underline{n} = 614$	Neutral $\underline{n} = 154$	Anti-hunting $\underline{n} = 214$	Total $\underline{N} = 982$
Professional	55.6	10.5	33.9	12.6
Student	58.8	0.0	41.2	3.5
Manager-Administrator	68.4	12.6	19.0	9.7
White-collar, skilled	70.5	12.3	17.2	12.4
White-collar, semi-skilled	54.1	21.9	24.0	14.9
Housewife	56.5	22.3	21.2	17.3
Farmer	61.9	18.5	19.6	9.4
Blue-collar, skilled	71.8	17.6	10.6	8.6
Blue-collar, semi-skilled	71.1	10.5	18.4	11.6

individuals was in the family-income category of less than \$5,000 and was almost constant for the other categories. The proportion of individuals neutral toward hunting decreased with increases in family income. The proportion of individuals with pro-hunting attitudes increased with family income.

Considering the previous classes that had the highest percentage of individuals with anti-hunting attitudes, the fact that the lowest income class had the highest percentage of anti-hunting individuals seems contradictory. However, a high percentage of students had anti-hunting attitudes and they are likely to have an annual income of less than 5,000 dollars. The over-60 class had the highest percentage of anti-hunting individuals and they may often be retired and therefore

Table 6. Relationship between family income and attitude toward hunting expressed as the percentage of each attitude category per income class. Chi-square = 36.8, 3 df, $P < 0.001$; Cramer's $V = 0.136$; and Tau $c = -0.097$, $P < 0.001$.

Family income (dollars)	Pro-hunting $\underline{n} = 629$	Neutral $\underline{n} = 152$	Anti-hunting $\underline{n} = 217$	Total $\underline{N} = 998$
<5,000	42.4	28.0	29.6	13.2
5,000 - 10,000	62.6	17.3	20.1	25.0
10,000 - 15,000	67.4	11.6	21.0	27.7
15,000 - 25,000	66.1	13.3	20.6	23.3
>25,000	71.3	8.3	20.4	10.8

have a low income. Either of the above groups could have a 4-year college degree or more. Because the question on occupation asked "What is (or was, if retired) the name of your occupation or job title," these individuals could be from any of the occupation classes.

Hunting-related values and beliefs

According to the model (Figure 1), beliefs and values should be more closely associated with attitude toward hunting than background variables. An anti-hunting attitude was associated most strongly with the anti-cruelty, anti-violence, anti-gun and anti-kill values (Tables 7 and 8). Anti-hunting individuals also did not believe hunting renewed man's ties with the environment (Table 9), was a source of companionship (Table 10), nor that hunters supported conservation activities (Table 7). They felt that sport hunting did not require skill (Table 11), that animals had no chance against guns (Table 7), and that hunting had a detrimental effect on the natural world (Table 12). The remainder of beliefs listed (Table 7) were not as strongly associated with attitude toward hunting.

Background variables and beliefs and values about hunting

If background variables influence the values and beliefs an individual acquires about hunting, then relationships should exist

Table 7. Percentage of individuals in each attitude category who held a particular belief, and relationships between those beliefs and attitudes. All Tau c values significant at <0.001 level except for the last which was not significant, and the one above it, which was significant at the 0.003 level.

Belief	Pro-hunting $\underline{n} = 654$	Neutral $\underline{n} = 157$	Anti-hunting $\underline{n} = 227$	Cramer's V	Tau c
Hunting is cruel to wild animals	9.0	23.6	70.5	0.575	+0.456
Hunting is violent and I'm against violence	1.8	7.0	43.2	0.523	+0.295
I'm against guns	4.3	19.7	53.3	0.522	+0.374
Animals have no chance against guns	11.8	28.8	57.7	0.433	+0.357
Hunters support conservation activities	58.4	28.7	10.6	0.409	-0.401
Enjoy eating wild meat	60.1	37.6	12.8	0.389	-0.379
There are too many hunters	24.3	33.8	62.6	0.325	+0.285
Uses animals that would otherwise be wasted	39.8	28.7	7.5	0.282	-0.249
I like to shoot	28.4	7.6	5.3	0.267	-0.210
Too many people are shot while hunting	24.0	45.9	50.2	0.252	+0.233
Hunters damage property	33.9	50.3	59.5	0.220	+0.215
Game is killed but not eaten	18.3	22.4	41.4	0.218	+0.168
Don't believe in trophy hunting	61.9	59.2	78.0	0.144	+0.103
Too many hunters are game hogs	59.1	61.8	72.7	0.113	+0.099
I like to kill wild animals	4.4	0.0	1.8	0.098	-0.029
Hunting is a safe outlet for violent urges	4.7	7.0	4.4	0.039	+0.003

Table 8. Relationship between anti-kill sentiment and attitude toward hunting expressed as the percentage of each attitude category per number of statements checked that depicted an anti-kill sentiment. Statements were: "don't believe in killing for pleasure or sport" and "no wild animal should be killed." Chi-square = 264.3, 4 df, $P < 0.001$; Cramer's V = 0.357; and Tau b = 0.419, $P < 0.001$.

Number of statements checked	Pro-hunting $\underline{n} = 653$	Neutral $\underline{n} = 157$	Anti-hunting $\underline{n} = 227$
0	81.3	13.7	4.6
1	51.3	17.4	31.3
2	6.8	8.5	84.7

Table 9. Relationship between the belief that hunting renews ties with the natural environment and attitude toward hunting expressed as the percentage of each attitude category per number of statements checked that depicted the preceding belief. Statements were: "allows one to become a part of the natural environment" and "hunting renews man's ties with the natural world." Chi-square = 263.0, 4 df, $P < 0.001$; Cramer's V = 0.356; and Tau b = -0.454, $P < 0.001$.

Number of statements checked	Pro-hunting $\underline{n} = 653$	Neutral $\underline{n} = 157$	Anti-hunting $\underline{n} = 227$
0	40.2	21.5	38.3
1	78.6	13.9	7.5
2	92.2	4.9	2.9

between these sets of variables. Some significant correlations exist between the variables (Table 13) but most were not very strong. Sex had the most and strongest correlations followed by family income. Overall, the relationship between these two sets of variables was not strong (Figure 1).

Table 10. Relationship between the belief that sport hunting provides companionship and attitude toward hunting expressed as the percentage of each attitude category per number of statements checked that depicted the preceding belief. Statements were: "companionship with fellow sportsmen" and "companionship with son, daughter or another child." Chi-square = 230.5, 4 df, $P < 0.001$; Cramer's $V = 0.333$; and Tau $b = -0.408$, $P < 0.001$.

Number of statements checked	Pro-hunting $\underline{n} = 654$	Neutral $\underline{n} = 157$	Anti-hunting $\underline{n} = 227$
0	34.9	20.9	44.2
1	72.7	13.8	13.5
2	83.3	10.5	6.2

Table 11. Relationship between the belief that sport hunting requires skill and attitude toward hunting expressed as the percentage of each attitude category per number of statements checked that depicted the preceding belief. Statements were: "taking the animal is reward for effort," "hunting allows one to learn basic survival skills" and "success depends mostly on knowledge." Chi-square = 211.2, 6 df, $P < 0.001$; Cramer's $V = 0.319$; and Tau $c = -0.364$, $P < 0.001$.

Number of statements checked	Pro-hunting $\underline{n} = 654$	Neutral $\underline{n} = 156$	Anti-hunting $\underline{n} = 227$
0	38.8	18.4	42.8
1	65.3	16.8	17.9
2	80.5	13.4	6.1
3	92.9	5.7	1.4

Relationships between the three major sets of variables

As predicted, the overall relationship between values and beliefs about hunting and attitudes toward hunting was stronger than either of the other two overall relationships between sets of variables (Figure 1).

Table 12. Relationship between the belief that sport hunting has a harmful effect on the natural world and attitude toward hunting expressed as the percentage of each attitude category per number of statements checked that depicted the preceding belief. Statements were: "Sport hunting endangers some wildlife species," "killing wild animals upsets nature's balance" and "hunting alters the natural habits of wild animals." Chi-square = 213.5, 6 df, $P < 0.001$; Cramer's V = 0.321; and Tau c = 0.301, $P < 0.001$.

Number of statements checked	Pro-hunting $\underline{n} = 654$	Neutral $\underline{n} = 157$	Anti-hunting $\underline{n} = 227$
0	79.7	14.7	5.6
1	65.7	15.6	18.7
2	42.9	18.8	38.3
3	18.2	9.1	72.7

This should be expected since beliefs and values are intimately associated with attitudes (Triandis 1971).

Issues Related to Wildlife Management

Attitudes are social-psychological phenomena which help individuals understand and cope with a complex world. By grouping their beliefs about certain events and ideas, people can reduce the number of novel situations they encounter, and thereby simplify their environments. They can then behave in a manner that will most often benefit them.

Attitudes are also involved in the process of stereotyping. By this process, an individual may be placed in a certain group based on only one or a few characteristics they possess. Stereotypes are not always accurate, especially when polar opposite groups are involved. Beliefs held by one such group about the opposite group are often negative. In this situation, both groups often perpetuate myths about each other which are not accurate or realistic. Such tendencies are not conducive to resolving conflicts between groups (Sherif 1966). In the absence of

Table 13. Tau c values for relationships between background variables and values and beliefs related to hunting. $p < 0.05 = *$, $p < 0.01 = **$, and $p < 0.001 = ***$.

Beliefs and values	Sex	Age	Childhood Residence	Education	Occupation	Family Income
Anti-kill	0.096**	0.051*	0.042*	-0.032	-0.048*	-0.147***
Negative effect on natural world	0.079**	0.005	0.024	-0.005	-0.027	-0.089**
Provides companionship	-0.155***	-0.007	-0.003	0.107***	-0.004	0.164***
Requires skill	-0.202***	-0.026	-0.032	-0.002	0.093***	0.047
Allows one to renew ties with natural environment	-0.186***	-0.057*	-0.027	0.026	0.053*	0.080*
Anti-cruelty	-0.093***	-0.008	-0.084**	-0.016	0.067*	0.062*
Anti-violence	-0.067***	-0.058**	-0.057**	-0.006	0.039*	0.072***
Animals have no chance against guns	-0.112***	-0.050*	-0.043	0.051*	0.053*	0.056*
Anti-gun	-0.140***	-0.028	-0.094***	-0.026	0.108***	0.064**
Hunters support conservation activities	0.159***	0.073*	-0.060*	-0.078**	-0.001	-0.073*
Hunters damage property	-0.063*	-0.132***	0.040	-0.014	-0.019	0.067*

a common goal, the conflict between them will continue, and probably increase. Some of these problems relative to pro- and anti-hunting groups and potential solutions will be discussed in this section.

Funding

Sport hunting is often defended because hunters supply the majority of funds for wildlife management. If those with anti-hunting attitudes already know that hunters supply a majority of the funds for wildlife management, repeating that fact to them probably will not make their attitude toward hunting more positive. The hypothesis that individuals holding anti-hunting attitudes will have a less accurate perception of the sources of wildlife funding than individuals who hold neutral or pro-hunting attitudes was rejected (Table 14). Differences between groups in how they perceived the sources of funding were slight; those neutral toward hunting varied more from pro- and anti-hunting individuals than the latter two did between themselves.

Wildlife conservation could be freed from management for hunters if the source of funds was neither directly (license sales) nor indirectly (tax on arms and ammunition) linked with hunting. Nonhunting-related sources include general taxes. People with anti-hunting attitudes who are concerned about wildlife and aware of present funding should want funding to come from a nonhunting-related source, because the quality of wildlife conservation would then not need to be directly linked to hunting. As hypothesized, individuals holding anti-hunting attitudes were more likely to desire funding from general revenue sources than individuals holding neutral or pro-hunting attitudes, but differences were small and not significant (Table 15). A larger proportion of anti-hunting individuals than neutral or pro-hunting individuals felt money should come from federal taxes, taxes on liquor, and taxes on cigarettes, though the differences were not significant except for the tax on cigarettes. State taxes were the exception, with a higher percentage of pro-hunting individuals desiring that source than anti-hunting individuals.

Many pro-hunting individuals believe people with anti-hunting attitudes want to eliminate hunting and are unconcerned with funding

Table 14. Percentage of people in each attitude category who checked the following choices in response to the question: "Where do you think the money for wildlife conservation in the state of Iowa presently comes from? (Please check the two sources you think are most important.)" Chi-square, $P < 0.05$ = *, $P < 0.01$ = **, and $P < 0.001$ = ***.

Source	Pro-hunting $n = 640$	Neutral $n = 153$	Anti-hunting $n = 219$
General federal taxes	12.7	16.3	12.3
General state taxes	47.0	44.0	50.2
Sale of hunting licenses in Iowa*	93.9	88.9	88.6
Federal tax on arms and ammunition	38.8	32.7	32.4
Tax on liquor**	2.2	7.2	2.3
Tax on cigarettes***	0.8	4.6	0.9
Other (please specify)	2.3	1.3	1.8

for wildlife. This belief was not substantiated. Conversely, anti-hunting individuals were often more positive toward general funding for wildlife than either pro-hunting or neutral individuals. A higher percentage of anti-hunting individuals wanted more of their tax funds devoted to wildlife conservation than either pro-hunting or neutral individuals (Table 16). A higher percentage of anti-hunting individuals indicated their willingness to contribute to a fund to support nongame wildlife than pro-hunting individuals or those neutral toward hunting (Table 17). Anti-hunting individuals were also willing to contribute a greater amount to non-hunted wildlife than either other group.

Management priorities

The public was also asked "If your tax money were directly supporting all wildlife management in the state of Iowa, how would you want your tax money spent?" People with different attitudes toward hunting had

Table 15. Percentage of people in each attitude category who checked the following choices in response to the question: "Where do you think the money for wildlife conservation in the state of Iowa should come from? (Check as many as apply.)" Chi-square, $P < 0.05 = *$, $P < 0.01 = **$, $P < 0.001 = ***$.

Source	Pro-hunting $n = 640$	Neutral $n = 153$	Anti-hunting $n = 220$
General federal taxes	20.3	17.0	21.8
General state taxes	46.4	37.3	42.3
Sale of hunting licenses in Iowa***	93.8	85.0	86.4
Federal tax on arms and ammunition*	65.2	52.9	64.1
Tax on liquor	16.9	18.3	23.2
Tax on cigarettes	13.3	15.7	20.5
Other (please specify)	2.7	3.3	3.6

Table 16. Percentage of people per attitude category who checked the following choices in response to the questions: "If your tax money were directly supporting all wildlife management activities in the state of Iowa, how would you want your tax money spent? Please check the appropriate box (only one please) in front of your choice: I would like to see more, same, or less funds devoted to wildlife conservation." Chi-square = 20.9, 4 df, $P < 0.001$.

Relative amount	Pro-hunting $n = 631$	Neutral $n = 137$	Anti-hunting $n = 216$	Total $N = 984$
More	55.2	42.3	62.5	55.0
Same	41.8	50.4	31.5	40.7
Less	3.0	7.3	6.0	4.3

Table 17. Percentage of people per attitude category who checked the following responses to the question: "How much would you be willing to contribute each year to a special fund for non-hunted wildlife?" Chi-square = 21.7, 8 df, $P < 0.01$.

Amount (dollars)	Pro-hunting $n = 576$	Neutral $n = 125$	Anti-hunting $n = 201$	Total $N = 902$
0	41.3	60.0	36.8	42.9
1 - 5	32.8	23.2	31.8	31.3
6 - 10	16.2	12.0	21.4	16.7
11 - 20	7.6	4.0	7.0	7.0
21 or more	2.1	0.8	3.0	2.1

different views on management policies (Table 18). A greater proportion of anti-hunting individuals wanted funds devoted to non-hunted wildlife, and hiring more wildlife managers and biologists. More pro-hunting individuals wanted money devoted to management for hunted species, stocking programs and continuing the present management system than did anti-hunting individuals. Interest in increasing predator control efforts and hiring more law enforcement officers was low for all groups. Fortunately for wildlife managers, all groups had the greatest percentage of people who felt funds should be used to "purchase land for wildlife", with no significant difference between groups. Habitat preservation is a policy which all groups supported and could serve as a common goal for the two opposing groups.

Improvements in sport hunting

Another potential method to reduce conflict between groups with different attitudes toward hunting would be to alter the sport in some manner that appeals to all groups. The alteration or "improvement" desired by the highest percentage of people across all groups with no significant difference between groups was to require a hunter safety course (Table 19). The next three most-favored changes included requiring a certain degree of accuracy in shooting, a vision test,

Table 18. Percentage of people in each attitude category who checked the following choices in response to the question: "If your tax money were directly supporting all wildlife management activities in the state of Iowa, how would you want your tax money spent? I would like these funds devoted to:"

Chi-square, $P < 0.05 = *$, $P < 0.01 = **$ and $P < 0.001 = ***$.

Management objective	Pro-hunting $\underline{n} = 646$	Neutral $\underline{n} = 155$	Anti-hunting $\underline{n} = 223$	Total $\underline{N} = 1024$
Purchase land for wildlife	59.1	50.3	62.3	58.5
Wildlife that is hunted***	51.4	25.2	35.4	43.9
Wildlife that is not hunted***	36.4	31.6	53.4	39.4
Hire more wildlife managers and biologists***	32.8	27.1	44.8	34.6
Stock more huntable birds and animals***	36.2	21.9	8.1	27.9
Continue the present system of wildlife management**	29.1	31.0	20.2	27.4
Hire more law enforcement officers	20.7	20.0	26.9	22.0
Increase predator control efforts	20.7	16.8	19.7	19.9

and a basic knowledge of wildlife before allowing the purchase of a license. Restricting the number of hunters and eliminating hunting in road ditches received limited support. All other alternatives (Table 19) received little support.

Table 19. Percentage of people in each attitude category who checked the following choices in response to the question: "Do you think any of the following would be an improvement on the present hunting system? (Check all that you feel would improve sport hunting.)" Chi-square, $P < 0.05 = *$; $P < 0.01 = **$, and $P < 0.001 = ***$.

Improvements	Pro-hunting $\underline{n} = 652$	Neutral $\underline{n} = 160$	Anti-hunting $\underline{n} = 226$	Total $\underline{N} = 1038$
Require a hunter safety course	71.8	76.3	79.2	74.1
Require a basic knowledge of wildlife as demonstrated by a test, before allowing the purchase of a license***	48.9	50.0	63.4	52.3
Require a certain degree of accuracy in shooting before obtaining a license***	43.4	50.0	58.1	47.6
Require a vision test to obtain a hunting license***	42.6	48.8	59.5	47.3
Eliminate hunting in road ditches***	33.9	47.5	53.7	40.3
Restrict the number of hunters***	22.9	25.0	45.4	28.1
Raise the license fee so only those highly motivated to hunt would participate***	11.2	14.4	32.3	16.3
Open a mourning dove season***	12.1	4.4	3.5	9.1
Liberalize hunting seasons	9.7	7.5	6.2	8.6

SUMMARY

The formation of anti-hunting attitudes was associated with background variables which in turn were associated with values and beliefs related to hunting. Background characteristics associated with an anti-hunting attitude include being female, from an urban childhood residence, over 60 or under 30 years of age, a 4-year college degree or more, student or professional occupation, and a low family income. Values associated with an anti-hunting attitude include anti-cruelty, anti-violence, anti-gun, and anti-kill. Anti-hunting individuals did not believe hunting renewed man's ties with the environment, was a source of companionship, nor required skill. They felt it had a detrimental effect on the natural world, and animals had no chance against guns. Beliefs and values were more strongly associated with attitude toward hunting than were background variables.

Anti-hunting individuals generally did not differ significantly from pro-hunting individuals in the way they believed wildlife management was presently funded. They were only a little more in favor of general revenue sources of funding than were pro-hunting individuals. A higher percentage of anti-hunting individuals wanted more of their taxes going toward wildlife conservation than did pro-hunting or neutral individuals. A higher percentage of anti-hunting individuals was also willing to contribute a greater amount to nonhunted wildlife.

Pro-hunting and anti-hunting individuals differed, as might be expected, on wildlife-management priorities. A greater proportion of anti-hunting individuals wanted funds devoted to nonhunted wildlife and hiring more wildlife managers and biologists. More pro-hunting individuals wanted money devoted to hunted species, stocking programs and continuing the present system of wildlife management. All groups had the highest percentage favoring the purchase of land for wildlife.

The potential improvement in sport hunting desired by the highest percentage of all groups was a hunter-safety course. Other measures favored by all groups, but more so by anti-hunting and neutral groups, were requiring a certain degree of accuracy in shooting, a basic knowledge of wildlife, and a vision test prior to the purchase of a hunting license.

RECOMMENDATIONS AND CONCLUSIONS

Anti-hunting attitudes are based on a wide range of beliefs and values and those attitudes probably would be difficult to change. Reduction of anti-hunting sentiments is not likely to occur in our continually urbanizing society with a continually declining percentage of hunters. The pressure from people with anti-hunting attitudes may be relieved by improvements within the sport hunting system of our country. Such improvements would tend to negate the assumed "right" to hunt and make it more of a privilege, similar to the European system. Improvements could include a hunter-safety course, accuracy in shooting, a knowledge of wildlife, and a vision test before allowing the purchase of a hunting license. Such a system could also alleviate problems in maintaining quality in sport hunting and hunter-landowner relationships.

Any measures which might reduce hunter license sales and hunting participation would also create problems for wildlife managers due to the present system of funding for wildlife management. A source of funding for wildlife conservation not directly connected with hunters would seem desirable. Such funding would allow management for the best interest of both wildlife and the public without the pressure to manipulate ecosystems to produce more huntable species. The need to encourage high hunting participation in a sport where crowding often reduces quality would also be eliminated.

The conflict between those against and for hunting could be reduced if the two groups would unite their efforts to attain the ultimate goal of habitat preservation for wildlife. While the groups differ on how wildlife should be utilized, they both are concerned about preserving wildlife habitat and they could unite in that effort. According to this research, the two groups do have that common goal and they are closer to each other in their desired management than those neutral on the issue of hunting. Modification of the funding for wildlife management would help in the transition.

Much of what was recommended here is not new but has been stated by other wildlife professionals in the past. Some progress has been made in this area, such as Missouri's 0.125 percent sales tax for wildlife

conservation. Much more progress is necessary or the current controversy will increase and polarity between pro- and anti-hunting individuals will make the problems more difficult to reconcile in a satisfactory manner. Wildlife managers should try to provide leadership and unite both groups to stop the decline of wildlife habitat. Both pro-hunting and anti-hunting individuals recognize that the biggest problem for wildlife is the continued loss of habitat. Wildlife conservation will progress more rapidly when people on both sides of the hunting controversy start to work together to preserve a healthy environment for wildlife and man.

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